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## EUROPEAN PATENT APPLICATION

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## (54) Self-testing of magneto-resistive memory arrays

(57) A collection of testing circuits (106, 108, 110, 112) are disclosed which can be used to form a comprehensive built-in test system for MRAM arrays (102). The combination of testing circuits can detect MRAM array defects including: open rows (209), shorted memory cells (211), memory cells which are outside of resistance specifications, and simple read/write pattern errors. The built-in test circuits include a wired-OR circuit (216, 218) connecting all the rows (206) to test for open rows (209) and shorted memory cells (211). A dynamic sense circuit (300, 400) detects whether the resistance of memory cells is within specified limits (510, 520). An exclusive-OR gate (616) combined with global write controls (612, 614, 620) is integrated into the sense amplifiers and is used to perform simple read-write pattern tests. Error data from the margin tests and the read-write tests are reported through a second wired-OR circuit (630). Outputs from the two wired-OR circuits and the associated row addresses are reported to the test processor (112) or recorded into an on-chip error status table (110).

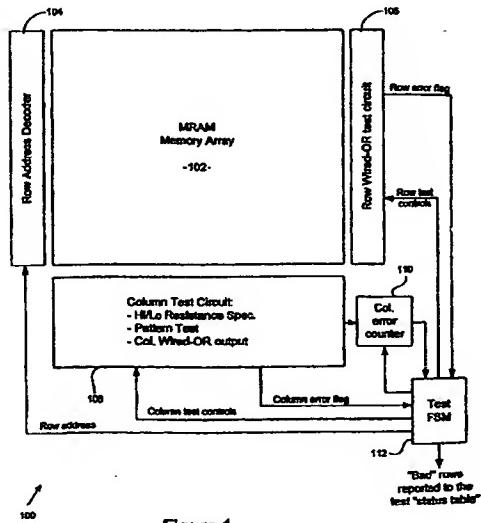


Figure 1



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## EUROPEAN SEARCH REPORT

Application Number

EP 00 12 2088

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The present search report has been drawn up for all claims			
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MUNICH	9 October 2002	Rios Baez, A	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons A : member of the same patent family, corresponding document	
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<p>The present search report has been drawn up for all claims</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Place of search</td> <td style="width: 33%;">Date of completion of the search</td> <td style="width: 33%;">Examiner</td> </tr> <tr> <td>MUNICH</td> <td>9 October 2002</td> <td>Rios Báez, A</td> </tr> </table>				Place of search	Date of completion of the search	Examiner	MUNICH	9 October 2002	Rios Báez, A
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X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document									

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ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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